

WE CLAIM:

1 1. A method for identifying a compound capable of interfering with
2 binding of a SAK polypeptide or fragment thereof, the method comprising the steps of:

3 (i) combining a SAK polypeptide or fragment thereof with a Chk2
4 polypeptide and the compound, wherein the SAK polypeptide or fragment thereof has
5 kinase activity and is encoded by a nucleic acid that hybridizes under stringent conditions
6 to a nucleic acid encoding a polypeptide having an amino acid sequence of SEQ ID
7 NO:2; and

8 (ii) determining the binding of the SAK polypeptide or fragment thereof to
9 Chk2.

1 2. The method of claim 1, wherein the SAK polypeptide or fragment
2 thereof and the Chk2 polypeptide are combined first.

1 3. The method of claim 1, wherein the binding of the SAK
2 polypeptide or fragment thereof to Chk2 is determined *in vitro*.

1 4. The method of claim 1, wherein the SAK polypeptide or fragment
2 thereof and the Chk2 polypeptide are expressed in a cell.

1 5. The method of claim 4, wherein the cell is a yeast or a mammalian
2 cell.

1 6. The method of claim 5, wherein the SAK polypeptide or fragment
2 thereof is fused to a heterologous polypeptide.

1 7. The method of claim 1, wherein the binding of the SAK
2 polypeptide or fragment thereof to Chk2 is determined by measuring reporter gene
3 expression.

1 8. The method of claim 1, wherein the binding of the SAK
2 polypeptide or fragment thereof to Chk2 is determined by measuring SAK kinase activity.

1 9. A method for identifying a compound that modulates cellular
2 proliferation, the method comprising the steps of:

3 (i) contacting the compound with a SAK polypeptide, the polypeptide
4 encoded by a nucleic acid that hybridizes under stringent conditions to a nucleic acid
5 encoding a polypeptide having an amino acid sequence of SEQ ID NO:2; and
6 (ii) determining the functional effect of the compound upon the SAK
7 polypeptide.

1 10. The method of claim 9, wherein the functional effect is measured
2 *in vitro*.

1 11. The method of claim 10, wherein the functional effect is a physical
2 effect.

1 12. The method of claim 11, wherein the physical effect is determined
2 by measuring ligand or substrate binding to the polypeptide.

1 13. The method of claim 10, wherein the functional effect is a chemical
2 effect.

1 14. The method of claim 13, wherein the chemical effect is determined
2 by measuring kinase activity of the SAK polypeptide.

1 15. The method of claim 9, wherein the polypeptide is expressed in a
2 eukaryotic host cell.

1 16. The method of claim 15, wherein the functional effect is a physical
2 effect.

1 17. The method of claim 16, wherein the physical effect is determined
2 by measuring ligand or substrate binding to the polypeptide.

1 18. The method of claim 15, wherein the functional effect is a chemical
2 or phenotypic effect.

1 19. The method of claim 18, wherein the chemical or phenotypic effect
2 is determined by measuring kinase activity of the SAK polypeptide.

1 20. The method of claim 18, wherein the chemical or phenotypic effect
2 is determined by measuring cellular proliferation.

- 1 21. The method of claim 20, wherein the cellular proliferation is
2 measured by assaying for DNA synthesis or fluorescent marker dilution.
- 1 22. The method of claim 21, wherein DNA synthesis is measured by
2 ³H thymidine incorporation, BrdU incorporation, or Hoescht staining.
- 1 23. The method of claim 21, wherein the fluorescent marker is selected
2 from the group consisting of a cell tracker dye or green fluorescent protein.
- 1 24. The method of claim 9, wherein modulation is inhibition of cellular
2 proliferation.
- 1 25. The method of claim 9, wherein modulation is inhibition of cancer
2 cell proliferation.
- 1 26. The method of claim 15, wherein the host cell is a cancer cell.
- 1 27. The method of claim 26, wherein the cancer cell is a breast,
2 prostate, colon, or lung cancer cell.
- 1 28. The method of claim 26, wherein the cancer cell is a transformed
2 cell line.
- 1 29. The method of claim 28, wherein the transformed cell line is PC3,
2 H1299, MDA-MB-231, MCF7, A549, or HeLa.
- 1 30. The method of claim 26, wherein the cancer cell is p53 null or
2 mutant.
- 1 31. The method of claim 26, wherein the cancer cell is p53 wild-type.
- 1 32. The method of claim 9, wherein the polypeptide is recombinant.
- 1 33. The method of claim 9, wherein the polypeptide is encoded by a
2 nucleic acid comprising a sequence of SEQ ID NO:1.
- 1 34. The method of claim 9, wherein the compound is an antibody.

- 1 35 . The method of claim 9, wherein the compound is an antisense
2 molecule.
- 1 36 . The method of claim 9, wherein the compound is a small organic
2 molecule.
- 1 37 . The method of claim 9, wherein the compound is a peptide.
- 1 38. The method of claim 37, wherein the peptide is circular.
- 1 39. A method for identifying a compound that modulates cellular
2 proliferation or chemosensitivity, the method comprising the steps of:
3 (i) contacting the compound with an SAK polypeptide or a fragment
4 thereof, the SAK polypeptide or fragment thereof encoded by a nucleic acid that
5 hybridizes under stringent conditions to a nucleic acid encoded by a polypeptide
6 comprising an amino acid sequence of SEQ ID NO:2;
7 (ii) determining the physical effect of the compound upon the SAK
8 polypeptide; and
9 (iii) determining the chemical or phenotypic effect of the compound upon
10 a cell comprising an SAK polypeptide or fragment thereof, thereby identifying a
11 compound that modulates cellular proliferation or chemosensitivity.
- 1 40. A method of modulating cellular proliferation in a subject, the
2 method comprising the step of administering to the subject a therapeutically effective
3 amount of a compound identified using the method of claim 9.
- 1 41. The method of claim 40, wherein the subject is a human.
- 1 42. The method of claim 41, wherein the subject has cancer.
- 1 43. The method of claim 40, wherein the compound is an antibody.
- 1 44. The method of claim 40, wherein the compound is an antisense
2 molecule.
- 1 45. The method of claim 40, wherein the compound is a small organic
2 molecule.

- 1 46. The method of claim 40, wherein the compound is a peptide.
- 1 47. The method of claim 46, wherein the peptide is circular.
- 1 48. The method of claim 40, wherein the compound inhibits cancer cell
2 proliferation.
- 1 49. A method of modulating cellular proliferation in a subject, the
2 method comprising the step of administering to the subject a therapeutically effective
3 amount of a SAK polypeptide, the polypeptide encoded by a nucleic acid that hybridizes
4 under stringent conditions to a nucleic acid encoding a polypeptide having an amino acid
5 sequence of SEQ ID NO:2.
- 1 50. A method of modulating cellular proliferation in a subject, the
2 method comprising the step of administering to the subject a therapeutically effective
3 amount of a nucleic acid encoding a SAK polypeptide, wherein the nucleic acid
4 hybridizes under stringent conditions to a nucleic acid encoding a polypeptide having an
5 amino acid sequence of SEQ ID NO:2.